

Wardsville Wastewater Collection & Treatment Plant Operations Report Fourth Quarter 2019

Submitted by:
Ontario Clean Water Agency
Date: February 10, 2020

Facility Description

Facility Name: Wardsville Wastewater Collection & Treatment Plant
Regional Manager: Dale LeBritton (519) 476-5898
Sr. Operations Manager: Sam Smith (226) 377-1540
Business Development Manager: Susan Budden (519) 318-3271
Facility Type: Municipal
Classification: Class 1 Wastewater Collection, Class 2 Wastewater Treatment

Service Information

Area(s) Serviced: Village of Wardsville
Population Served: 432
No. of Connections:
Water Meters: None
In service Date: 2001

Capacity Information

Total Design Capacity: 300 m³/day
Total Annual Flow (2017): 31324.24 m³/year
Average Day Flow (2017): 86.06 m³/day
Maximum Day Flow (2017): 214.7m³/day

Operational Description:

Extended aeration plant that takes septic tank effluent from a small bore collection system for treatment. Consisting of aeration tanks (2), clarifiers (2), and sand filters (2), to a post aeration tank, UV disinfection, discharging into the Thames River.

SECTION 1: COMPLIANCE SUMMARY

FIRST QUARTER:

There were no compliance issues to report in this quarter.

SECOND QUARTER:

In April the Monthly average for Total Phosphorus exceeded the limit in the ECA. This was due to higher flows with inadequate alum dosages during this time.

THIRD QUARTER:

In the evening on August 12th a power failure occurred shutting down the blowers. The power failure was too brief to even trigger the power outage alarm. Therefore, when the operators arrived on site the following day they discovered the situation and found that the blowers were not reset. As a result the nitrifying bacteria were stressed causing the TAN to rise. As a result the TAN single sample limit was reached (7mg/L) and E.-coli result was outside the limits (NDOGEC). All other parameters were within limits. A second set of samples were obtained on August 16th with results within the ECA limits.

FOURTH QUARTER:

On October 28th we received a result 1.12 mg/L for Total Phosphorus exceeding the single sample limit. Samples were also taken the 29th and 31st which were within compliance limits.

SECTION 2: INSPECTIONS

FIRST QUARTER:

No Inspections this quarter.

SECOND QUARTER:

No Inspections this quarter.

THIRD QUARTER:

No Inspections this quarter.

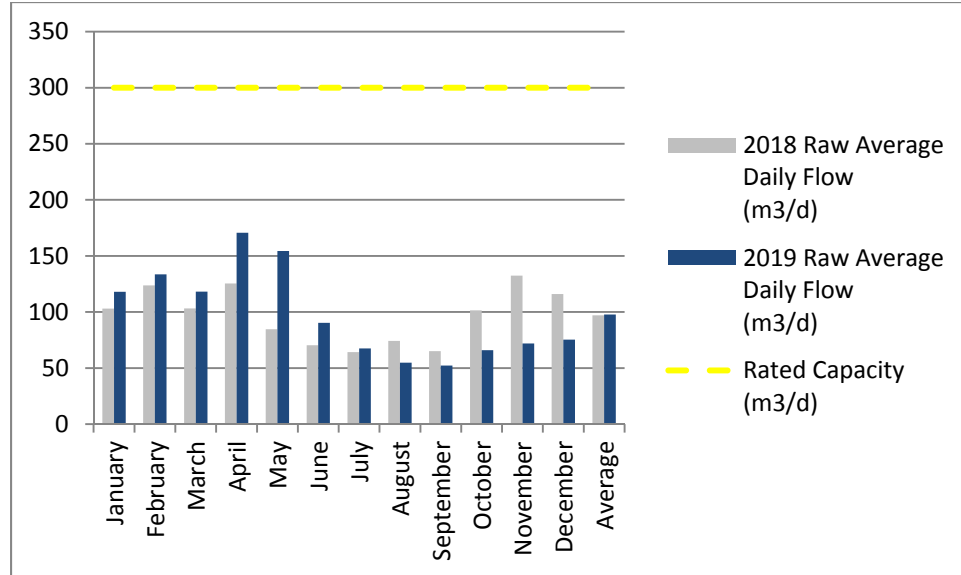
FOURTH QUARTER:

No Inspections this quarter.

SECTION 3: PERFORMANCE ASSESSMENT REPORT

The average daily flow in 2019 is 97.76m³/d. The average daily flow is up 0.79% in 2019 compared to the average daily flow in 2018, refer to Chart 1.

Chart 1. Raw Flows in 2019 Compared to 2018 Flows



Raw samples are taken once monthly following the ECA requirements. Table 1 provides the raw sample results for 2019 compared to the design objectives. There have been a 16 instances where the design objectives have been exceeded.

Table 1. Raw Water Sample Results for 2019

	BOD5 (mg/L)	TKN (mg/L)	TP (mg/L)	TSS (mg/L)
Design Objective	145	40	8	100
# Months Design Objective Exceeded	2/9	7/9	4/9	3/9
January	56	37.2	4.14	30
February	140	40.5	4.37	117
March	113	36.7	6.81	42
April	67	24.6	4.16	113
May	68	27.1	3.71	46
June	76	39.8	5.28	47
July	181	65.7	7.79	76
August	116	77.0	9.96	133
September	160	74.6	12.7	37
October	103	70.6	8.66	82
November	111	62.1	8.01	41
December	108	54.7	5.86	57

The effluent is sampled on a weekly basis following the requirements of the ECA. The table below summarizes the monthly average results compared against the objectives, limits and single sample limits identified in the ECA. The effluent results have met all the limits identified in the ECA with the exception of two exceedances:

- Total Phosphorus in April
- TAN in August
- TP in October

Table 2. Effluent Sample Results for 2019

	cBOD5(mg/L)	TSS (mg/L)	TP(mg/L)	TAN (mg/L)	E. coli (cfu/100mL)*	pH **	DO***
ECA Single Sample	15	15	1.0 (1.5)	4.5 (7.5)			4.0
ECA Objective	5	5	0.3 (0.8)	2.0 (4.0)	200	6.5-8.5	-
ECA Limit	10	10	0.5 (1.0)	3.0 (5.0)	200	6.0-9.5	-
January	2	3.2	0.16	0.2	2.862	6.8-7.65	10.54
February	2.25	3	0.25	1.3	2	6.68-7.65	9.54
March	2.25	3	0.25	0.23	2	6.26-6.91	9.99
April	2.17	8.5	0.52	0.32	2	6.53-7.74	8.32
May	3.5	7.7	0.04	0.45	2	7.08-7.95	8.63
June	2	3.3	0.41	0.1	2	7.14-8.14	8.18
July	2.2	3	0.14	1.4	1.52	6.21-8.33	5.92
August	2.4	4.8	0.34	2.1	1.68	6.39-7.72	5.4
September	2	3	0.41	1.2	1.68	6.7-8.07	5.15
October	2.4	4	0.50	0.14	3.50	6.77-7.75	7.25
November	2	4.25	0.39	0.1	2	6.96-7.99	8.76
December	2	3.8	0.39	0.12	1.51	7.12-8.07	8.16

*expressed as geometric mean

**minimum and maximum result range – single results

() indicates objective and limit Nov 1-Mar 31

***minimum result

Effluent average cBOD5 for 2019 is 2.26mg/L, meeting effluent objectives, limits and single sample limits identified in the ECA (refer to Chart 2 and 3). The annual average result for cBOD5 in 2018 was 2.13mg/L, therefore the results for 2019 are up 6.45% when compared to 2018 (refer to Chart 2).

Chart 2. Average Monthly Effluent cBOD5 Results for 2019 Compared to 2018

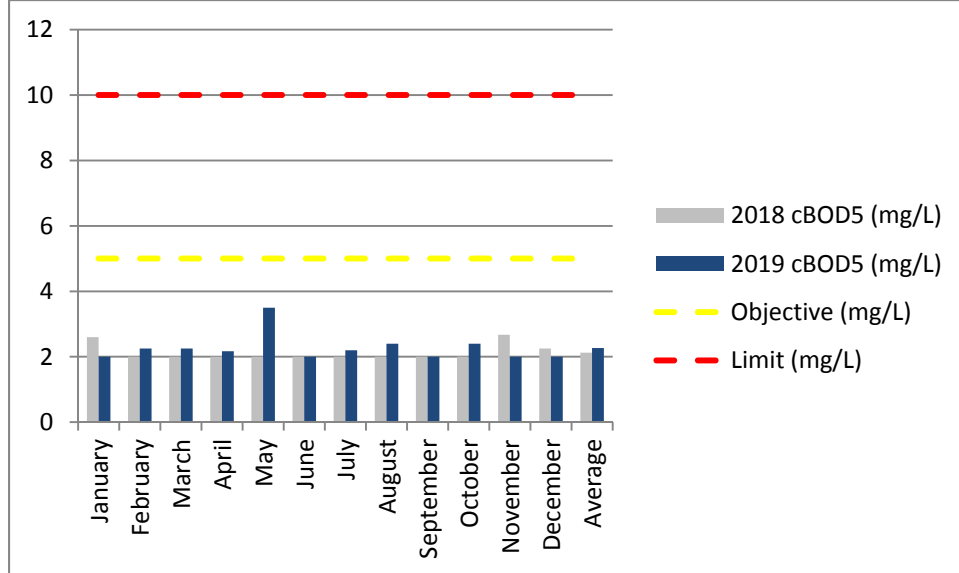
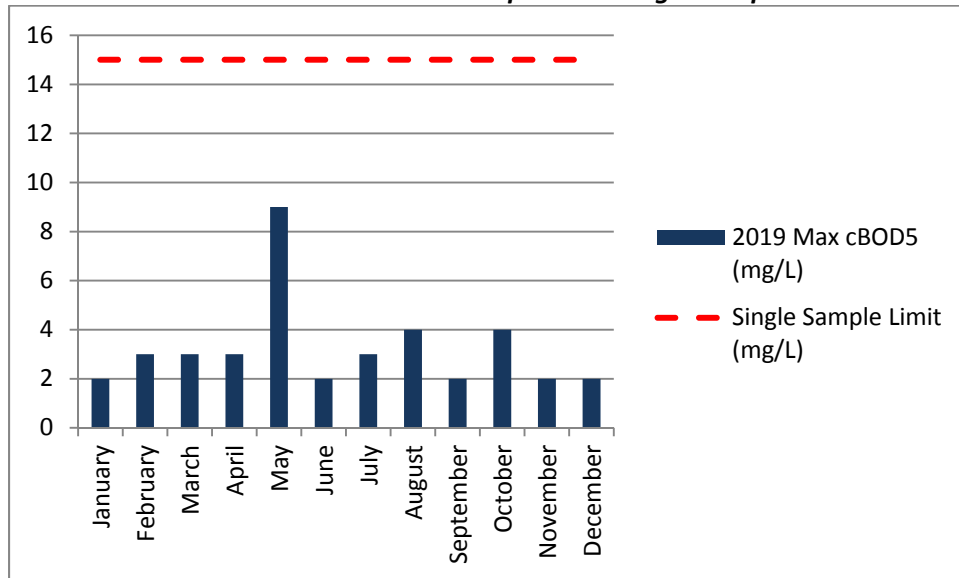


Chart 3. Maximum Results Compared to Single Sample Limits



Effluent average TSS for 2019 is 4.29mg/L, meeting effluent limits and single sample limits identified in the ECA (refer to Chart 4 and 5). There were objective exceedances in April and May due to higher flows (refer to Chart 4). The annual average result for TSS in 2018 was 3.45mg/L, therefore the results for 2019 are up by 24% when compared to 2018 (refer to Chart 4).

Chart 4. Average Monthly Effluent TSS results for 2019 compared to 2018.

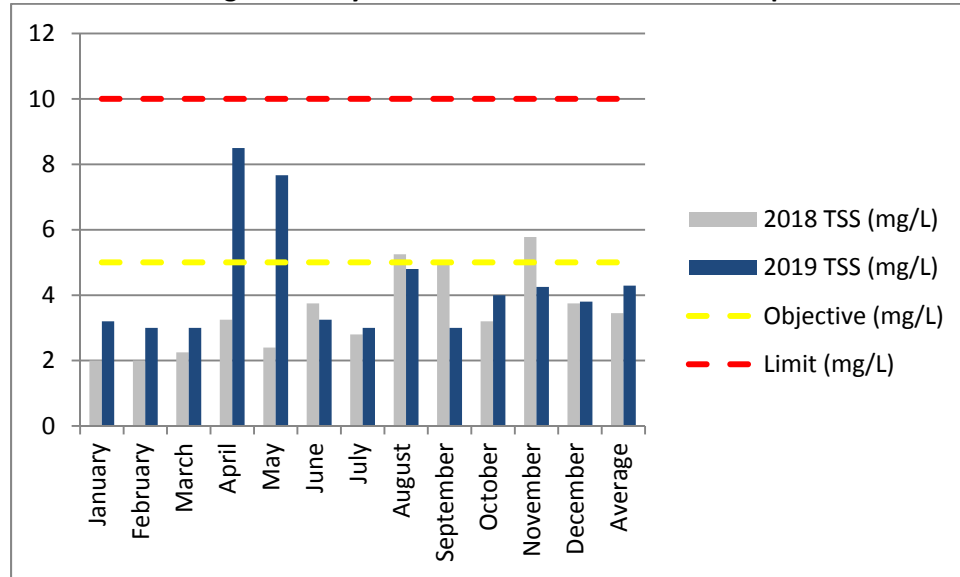
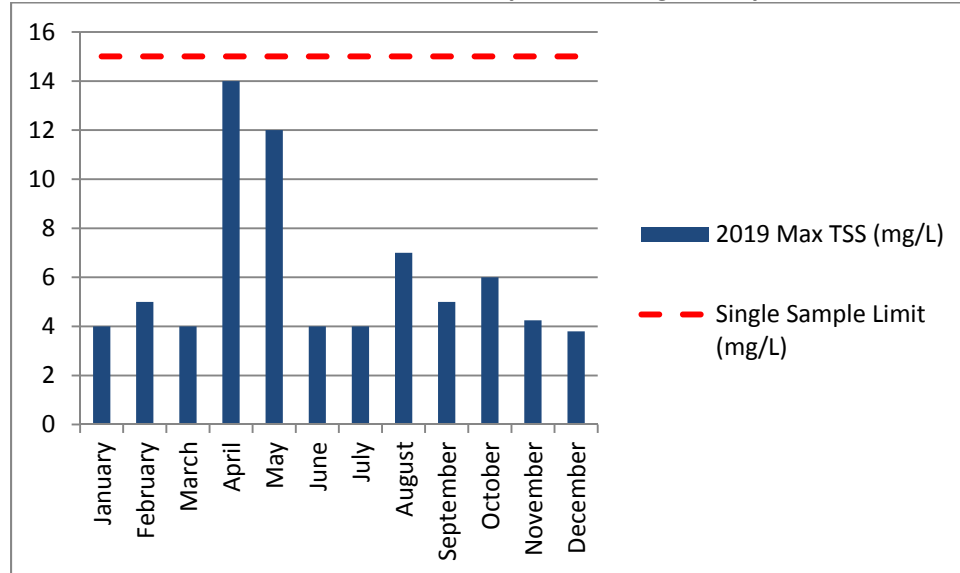


Chart 5. Maximum Results Compared to Single Sample Limits



Effluent average TP for 2019 is 0.35mg/L (refer to Chart 6). All sample results were below the single sample limit identified in the ECA with the exception of October. (refer to Chart 7). There was a monthly average limit exceedance in April due to higher flows being received at the plant. There were objective exceedances in April, May, June, August and September. These were due to higher flows in the spring and dosing issues with alum. The annual average result for TP in 2018 was 0.26mg/L, therefore the results for 2019 are up by 31% in 2019 when compared to 2018 (refer to Chart 6).

Chart 6. Average Monthly Effluent TP Results for 2019 Compared to 2018

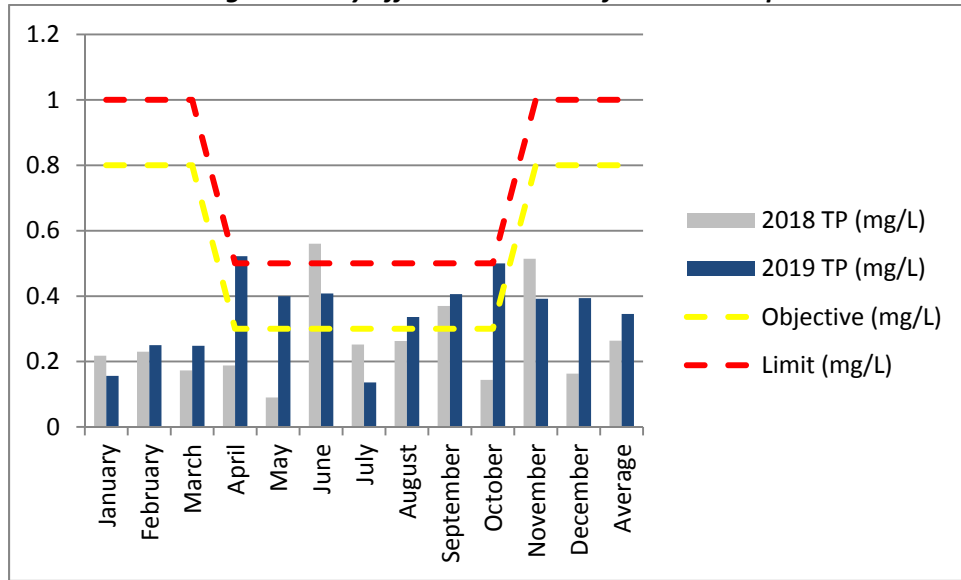
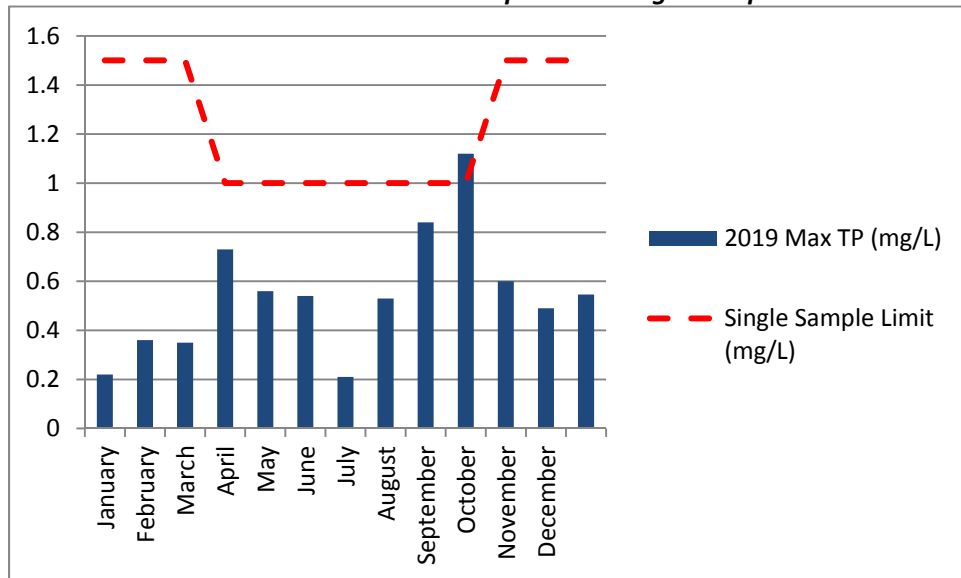


Chart 7. Maximum Results Compared to Single Sample Limits



Effluent TAN for 2019 is 0.64mg/L, meeting effluent limits (refer to Chart 8). There was one single sample limit exceedance in August (refer to Chart 9) which also resulted in a monthly average objective exceedance. The annual average result for TAN in 2018 was 0.66mg/L, therefore the results for 2019 are down by 2.9% when compared to 2018 (refer to Chart 8).

Chart 8. Average Monthly Effluent TAN Results for 2019 Compared to 2018

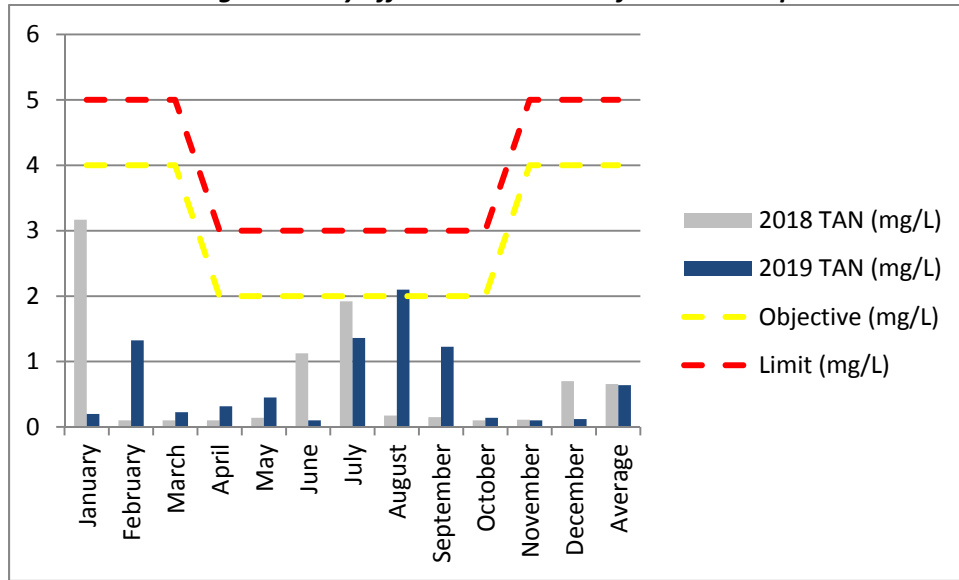
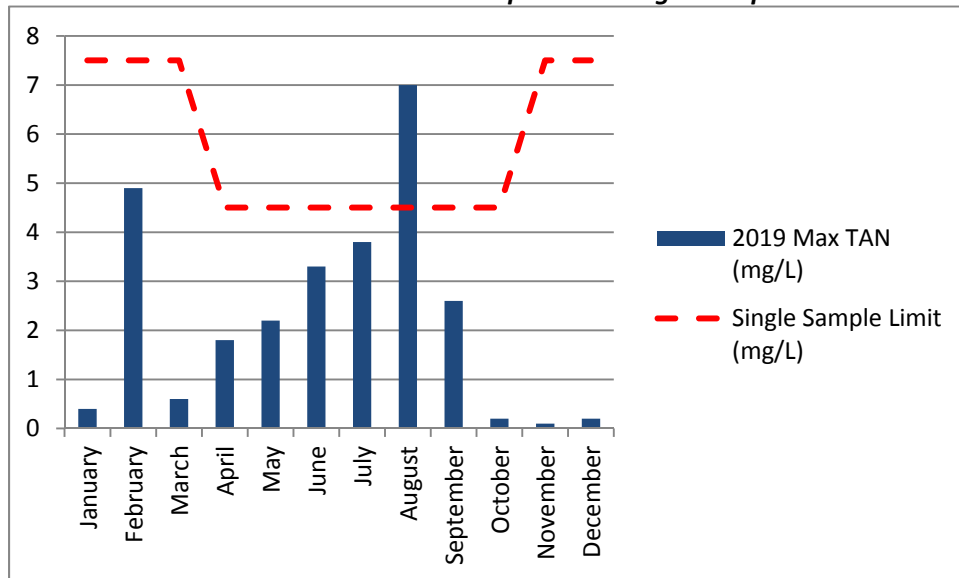
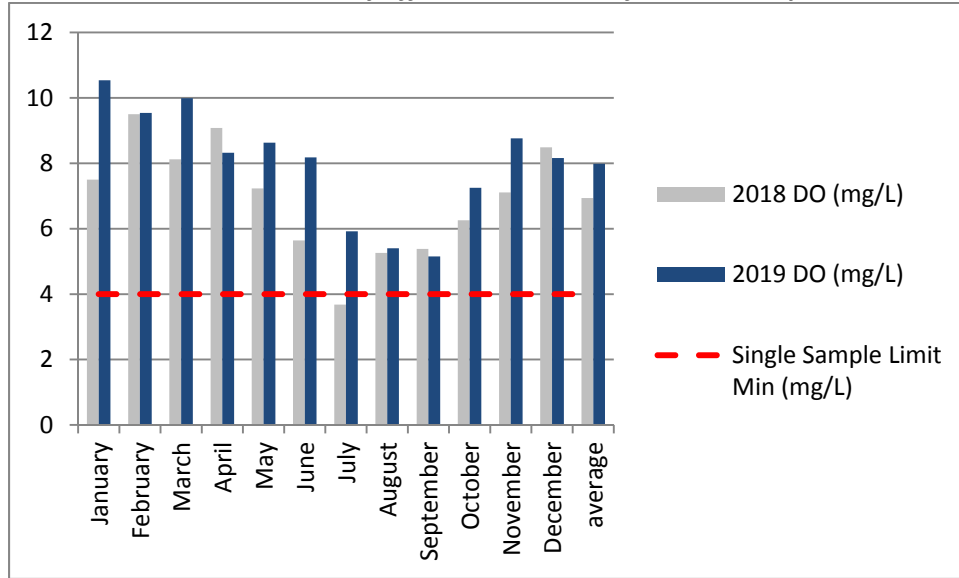


Chart 9. Maximum Results Compared to Single Sample Limits



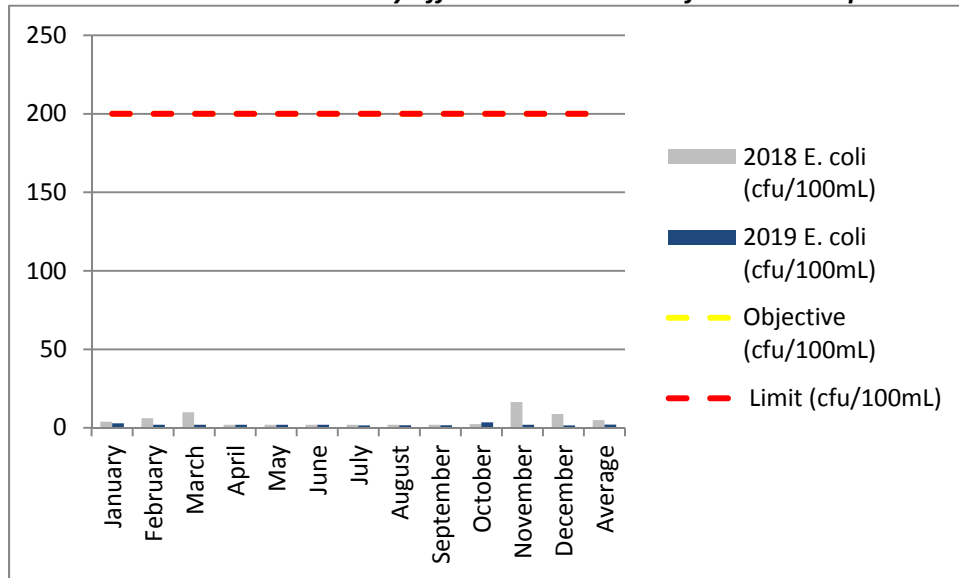
Effluent average minimum Dissolved Oxygen (DO) for 2019 is 8mg/L, this meets the single sample minimum limits identified in the ECA. Dissolved oxygen values are noted as minimum requirements. The annual average minimum result for DO in 2018 was 6.9mg/L, therefore the results for 2019 are up by 15.1% when compared to 2018 (refer to Chart 10).

Chart 10. Minimum Monthly Effluent DO Results for 2019 Compared to 2018



Effluent geometric mean E. coli for 2019 is 2.06cfu/100mL, meeting both effluent objectives and limits identified in the ECA. The annual geometric mean result for E. coli in 2018 was 4.96cfu/100mL, therefore the results for 2019 are down by 58% when compared to 2018 (refer to Chart 12).

Chart 12. Geometric Mean Monthly Effluent E. coli Results for 2019 Compared to 2018



SECTION 4: OCCUPATIONAL HEALTH & SAFETY

FIRST QUARTER:

There were no hazards identified during this quarter.

SECOND QUARTER:

There were no hazards identified during this quarter.

THIRD QUARTER:

There were no hazards identified during this quarter.

FOURTH QUARTER:

There were no hazards identified during this quarter.

SECTION 5: GENERAL MAINTENANCE

FIRST QUARTER:

JANUARY:

- 11: Installed a new clarifier tank and hooked up to main sewer for a new home at 11856 Longwoods Rd. Patten
Excavating was the contractor on site. All work completed with approval from the building inspector.
- 25: Triple S Sanitation on site at Babcock to pump out clarifier tanks.

FEBRUARY:

- 05: Generator monthly run test completed.
- 11: Installed another pump in the filter reject pit to lower the level and help prevent another high level call out.
- 14: Alum delivery from Chemtrade.

MARCH:

- 06: Data logger training
- 13: Cleaned facility process
- 14: Generator run test completed
- 20: Decanted the sludge holding tank

SECOND QUARTER:

APRIL:

- 02: 150 Davis St tank inspection. Found tank in high level, checked sewer main from manhole and found flow and main was not backed up. Called triple S and they vacuumed it out.
- 18: Noticed filter reject in high level, found the pump had quit. Set up a temporary sump pump to keep the level down.
- 26: Flowmetrix on site to verify and calibrate flow meters

MAY:

- 03: Blower 3 taken out of service. Gerber Electric was on site to change controls to allow blowers 1 and 2 to operate.
- 15: Cleaned clarifiers, and completed other general housekeeping around facility.

JUNE:

- 06: Alum delivery from Chemtrade received
- 07: Alum dosage increased to 13ml/min due to effluent quality

- 14: Screens to sand filters clogged; filters were cleaned
- 20: Screens to sand filters clogged; filters were cleaned
- 24: Maintenance work on RAS lines due to thick sludge reducing proper RAS flow

THIRD QUARTER:

JULY:

- 10: Gerber Electric on site to look at blower that reads high temperature
- 19: Isolated raw flow to east aeration to drain west clarifier due to return issues. Both filters are still connected and in service.
- 19: Chemtrade on site for alum delivery.

AUGUST:

- 06: Found alum gfi tripped. Operator reset breaker and all systems returned to normal. Operator started draining west clarifier into sludge holding tank. Both filters are online and receiving flow.
- 12: Found blower 4 and 5, as well as compressors 1 and 2 not operating due to power surge. Gerber Electric on site to repair; all systems returned to normal.
- 13: Arrived on site and noticed return on east aeration was not working. Operator repaired air line.
- 23: Installed new filter reject pump.

SEPTEMBER:

- 05: Nevro on site to install new blower
- 18: Nevro on site to fix leak in raw inlet pipe. Operator turned off pumps at main pump station to prevent raw inflow. Operator was on site to begin reseedling of west aeration tank; now pumping from east aeration tank into splitter box to prevent too much solids loss. Raw flow now going back into both sides.
- 23: Arrived on site and noticed RAS is not operating. Operator notified Senior Operations Manager who arrived on site to investigate. East RAS now operating normally.
- 26: Hurricane Vac on site to remove sludge from sludge holding tanks.

FOURTH QUARTER:

OCTOBER:

- 14: Discovered that the compressor was not running causing sand filters to not operate properly during daily checks. Reset compressor and verified sand filters are operating correctly.
- 16: Discovered system was backed up due to compressor faulting out and causing sand filter to not operate correctly. Reset compressor and verified that the sand filters are now operating normally; notified senior operations manager.
- 18: Isolated raw; inlet flow to West aeration tank. East aeration tank and clarifier now offline due to issues with return activated sludge. Both sand filters receiving flow and operating normally. Transferring suspended solids to west aeration tank from east aeration tank. Pumping down east clarifier to inspect return activated sludge to east aeration tank. Isolated alum dosing to west aeration tank, increased dosage to 15 mL/ min. All changes were made as requested by senior operations manager.
- 21: Transferring sludge from East clarifier to West aeration tank as instructed by senior operations manager.

NOVEMBER:

- 01: Central Sanitation on site for sludge delivery from Alvinston WWTP to introduce new/younger bugs to the process.
- 08: Installed insulation around the soda ash lines and turned on the heat trace for the alum lines.
- 12: Cleaned the UV lights and effluent chamber.
- 20: Central Sanitation on site for sludge delivery of 40006 (18m³) of new bugs to help the process.
- 25: Gerber Electric on site for the generator installation.

26: Gerber Electric on site to continue install of generator system and transfer switch. They also put grass seed down over freshly excavated dirt.

DECEMBER:

17-31: Water wells on site drilling a new well for the facility.

SECTION 6: ALARM SUMMARY

FIRST QUARTER:

JANUARY:

No alarms to report this month.

FEBRUARY:

10: Filter Reject High Level Alarm; operator arrived on site to find that the reject pump was running and pumping as intended. Operator checked pump to ensure proper operation. There was ice buildup on floats which may have caused the alarm. Operator cleared alarm and left the site.

11: Filter Reject High Level Alarm; Operator on site to find that the reject pit was "now normal" Verified pump function and cleared alarm. Noticed considerably more reject flow than usual and pumps couldn't keep up.

MARCH:

31: On site at pump station#2 for High Level alarm. Operator checked the pump station and found no issues with the pump station; also checked all the other pump stations and they were in proper operation as well. Call out due to possible power surge earlier in the day.

31: On site for pump station #2 high level alarm; operator checked all pump stations and they were not in high level. All systems appeared to be working properly.

SECOND QUARTER:

APRIL:

No alarms to report this month.

MAY:

04: On site for facility inspection and flow meter reading due to high flow. Daily flow was 249m³. Flows did not exceed limit of 300m³; no extra samples needed to be collected.

JUNE:

No alarms to report this month.

THIRD QUARTER:

JULY:

28: Onsite due to power outage; received page at 07:28. Operator found blowers 4 and 5 had tripped; reset blowers and power was restored at 10:32. All systems returned to operating normally.

AUGUST:

03: Received page for power outage at 00:10. Operator arrived on site, but power had already been restored. Operator completed checks and confirmed all systems were running normally before leaving site.

SEPTEMBER:

No alarms to report this month.

FOURTH QUARTER:

No alarms to report this quarter.

SECTION 7: COMMUNITY COMPLAINTS & CONCERNS

FIRST QUARTER:

No community complaints or concerns this quarter.

SECOND QUARTER:

No community complaints or concerns this quarter.

THIRD QUARTER:

No community complaints or concerns this quarter.

FOURTH QUARTER:

DECEMBER:

09: Received a call from Senior Operations Manager in regards to a complaint from a homeowner at 229 William Street in Wardsville with a sewer back up issue. Operator arrived on site and located the tank and inspected. Central Sanitation arrived on site to pump the tank out. Found that the homeowner's inlet line was plugged in between the tank and the house.